"The Sea Around Us"
Solutions for the Future of Our Oceans

Final Project Report for OEST 300

University of Hawaii-Manoa, Summer Term II

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ABSTRACT

"The Sea Around Us" is about "Solutions for the Future". The oceans are our last frontier, and they need to be protected. To inspire understanding and hopefully a love for the oceans, I desired to create a program that could be used in schools to promote intrigue and interest in science and the oceans.

An opportunity to teach a set of lessons on ocean awareness and conservation to a 3rd and 4th grade summer term science enrichment class at Iolani School provided a chance to:

- gather resource materials,
- organize an outline of relevant topics and concepts,
- consider and try various methods of presentation and complimentary activities,
- create a set of lesson plans, and
- design and administer a pre and post assessment of student knowledge.

My efforts to carry out these tasks have resulted in the following realizations:

- Although students live right near the ocean and are fascinated by it, they know very little about the ocean and the importance of protecting it. They were, however eager and interested learners.
- There are many teaching resources available that receive relatively little use. (Such as State Park programs and even programs that come into class rooms.)
- Designing lessons and assessments is much harder than I imagined.
- Contrary to my previous beliefs, it is harder to figure out what to exclude than to find something to include.

This experience was a terrific learning experience and will provide me with years of projects and insights. I am also thrilled to have my first "guide book" organized and together as an in progress resource tool for myself.

TABLE OF CONTENTS

ATTACHMENTS

The Sea Around Us: A Guide to Introducing Ocean Awareness and Conservation Concepts to the Elementary School Classroom.

Various Materials Used and collected during the course of this Project.

I INTRODUCTION

"The Sea Around Us" is about "Solutions for the Future". The oceans are our last frontier and they need to be protected. To inspire understanding and hopefully a love for the oceans, I desired to create a program that could be used in schools to promote intrigue and interest in science and the oceans.

The oceans are a fascinating place full of wonder and mystery. Many things about the oceans are still unknown, but it is my goal to take what is known and pass it on to the educators and ultimately to the students.

One of the major reasons I am working hard to create ocean awareness in young kids is that I spend time in a variety of ocean study venues (e.g. Monterey Bay Aquarium [MBA], Monterey Bay Youth [MBY], University of Hawaii at Manoa [UH], Heeia State Park, Iolani Lower School, etc.). I have often seen a disturbing lack of understanding about ocean science on the part of the students, and even some of the teachers or interpreters, who come through these sites. In many cases, this ignorance has turned into an alarming apathy about our oceans.

I have a love for the oceans and see the students' apathy stemming from boring, out of date textbooks and classes. Some solutions to this apathy would be using relevant, hands-on science to show students what their everyday world has to offer. I wanted to open their minds to their own world and show them things to think about. With this understanding they might choose to help preserve our natural environment.

An educational program for the schools would greatly enhance students' awareness of what they can do to help preserve the ocean environment. Having the scientific knowledge to make educated decisions relating to policies for and about the ocean is important for helping the environment in the future.

The most important thing I would like to accomplish in the course of the project is to help the students understand that there is an important interaction with water in their own front yard, and that they can do something about taking care of it. I wanted to briefly introduce the students to some of the science and social topics of the marine environment.

A successful accomplishment of the goals of this project would be to help students, to the best of their ability, feel stimulated to interact with science in their own way.

At the MBA we use an expression "the Conservation Continuum" this is a concept that ranges from apathy to being actively involved in changing things to help the environment. Our goal at the aquarium is to help move guests along this continuum and thus my goal with this project is to help introduce students to science and show them how to move themselves along this continuum.

II MISSION STATEMENT

My goal with the summer project was to create a set of lesson plans and a list of available materials that I could use in the elementary school classroom to teach about ocean pollution, conservation, awareness, and what individuals can do to care for the environment. It is important to further youth's understanding of the global ocean system and how the things we do affect local areas. This understanding will come through showing the connection and relevance of the ocean and other water issues to the students' own lives.

Students were able to demonstrate their understanding of the concepts of the program and of the different units. Their demonstrations of this understanding will come in many forms such as experiments, artwork, creative writing, etc. To assess their understanding of the science and social concepts random questions about the lessons were given for group discussion, presentations, and journal entries. These are designed to help the teacher explain concepts the class is having difficulty with or may have missed, and also to help me assess the efficiency of the program.

The program I have designed has six main topics: What is Water?; Water and the World; The Ocean Food; Animal Adaptations; Hawaiian Ecosystem; and Human Impacts. Each of these topics presents a set of desired outcomes and concepts. These topics are more fully treated in Section II in the attached Guide. There are two main sets of concepts being introduced in the program, one focusing on some of the basic science concepts involved and their

interactions with each other, the other focusing on social effects and implications in the marine environment. These concepts are set forth in Section I, p. 6&7 of the attached Guide.

What I want to accomplish in the classroom:

In the two weeks I had to present lessons in the classroom I wanted to briefly introduce the students to some of the science and social topics of the marine environment. This would be the trial run of a program designed to target kindergarten through sixth grades.

This program's intention is to be useful to teachers as a fun ocean science unit briefly introducing the marine ecosystem. Now, because of the fact that most of the time ocean courses are incorporated into an entire curriculum, it would be played out in a summer science and math class of students entering grades 3 and 4 which was right in the middle of the grade spectrum, giving me a good idea of the strengths and weaknesses of the curriculum and the activities at certain levels. This program can be expanded but I will address that later in the course review section.

This program was presented with a curriculum that was already established and was somewhat tailored for the summer program. It used journals that were already part of the class and were used for testing the understanding and effectiveness of the unit. For details of the curriculum that lead up to this unit refer to Appendix B.

III THE PROGRAM

Teaching Tools

An effort has been made to utilize many different ways to introduce and expose the students to the topics and concepts of the program. These topics and concepts are treated more fully in Section II and include such things as presentations, lessons, experiments, artworks, discussions, and creative writings. However, some of the other methods of exposure include the following:

Water Words

I found it very helpful from the beginning to have what I called "The Water Words." This was a list of new words we learned during the lesson and should be dependent on the class and the students knowledge level. At the beginning of the classes I either reviewed the words or had a discussion about the words. Choosing only one concept from each lesson and focusing on it seemed to have the best results in furthering the students understanding.

An example of "Water Words" I have used in class included some of the following: marine, ecosystem, molecule, positive, negative, electron, hydrogen, oxygen, hydrophilic, hydrophobic, polar, non-polar, watershed, water cycle, upwelling, nutricline, thermocline, phytoplankton, zooplankton, heat sink, insulation, etc.. "Water Words" were used to stimulate class discussion at the beginning or end of every day.

Journal

The Journal was used as a creative writing tool drawing on some of the thought questions contained in the Lesson Plans or

questions from "The List of Questions" on pg. 12 of the assessment section. Questions were written on the board and the students were asked to think about and then respond to them in their journals. This was used in place of tests and helped me see what the students were thinking. The journal was read after every entry by me but was not graded or corrected other than encouraging the students to write more.

Readings, Videos, Speakers, and Field Trips

Readings, showing videos, outside speakers, and field trips helped the students with bringing concepts into the curriculum in a different learning style. These also showed that there were others out there that felt or did the same things that we were doing and considered it important. It also introduced the importance of literature and art incorporated in the sciences.

These tools, the class discussions, the Journal, and the water words were used to bring the following sections together as one unit.

Topic Sections and Concepts Introduced

1. What is Water?
   - hydrophilic
   - hydrophobic
2. Water and the World.
   - water and light
   - the water cycle
   - watersheds
   - water movement
   - water layers: thermoclines and nutriclines
   - minerals and nutrients
3. The Ocean Food Web
   - sunlight
   - Phytoplankton ->Animals

- nutrients and biogeochemical cycles

4. Animal Adaptations
   - camouflage
   - hard-shells
   - closing up
   - pressure
   - heat sink
   - protecting against desiccation
   - coloring
   - fat and skin
5. Hawaiian Ecosystem
   - coral reefs building and maintaining
   - fishes
   - runoff
6. Human Impacts
   - pollution and plastics
   - overfishing
   - habitat destruction

IV CONCLUSIONS

Class Reviewed

The above curriculum is what I recommend from the experiences I had developing and teaching in the classroom. The curriculum is pretty much the same as the one I used but it has a few adaptations for better flow and use.

The lessons having to do with light were put into one lesson done before the ocean unit because photosynthesis had not been introduced yet. This is an essential piece of the ocean food web and was thus taught as an entire section. In order to make the light lesson more of a component in the lesson it was split up and incorporated into this plan.

The other lesson that was pulled out was the recycled paper making. It was also done earlier, circumstances being that this unit was done at the end of the class and we didn't use irons (Paper Making, Lesson Plans). We needed to allow time for drying. The lesson plan for the paper making lesson included here is different than the one I used but much cleaner and easier for the students and for the instructor.

Due to time and money constraints we had to choose one field trip but the lesson plan again is in a perfect world plan. The following schedule is the one that was used for my program.

Schedule For Unit

Friday
- Light lesson
- Suncatchers

Monday
- Questionnaire
- Read book: Our Ocean Our Home (Nelson, 1997)
- Built water molecules
- Oil vs. water and oil spill

Tuesday
- Soap Making

Wednesday
- Water experiments
- Water cycles video
- Write on were water comes from

Thursday
- Water displacement
- Nutrients in the ocean
- Food web game

Friday
- Read Brother Eagle, Sister Sky (Chief Seattle, 1991)
- Draw on frames
- Insulation experiment

Monday
- Review of class data
- Ocean pictures
- Cinquain

Tuesday
- Story about sea turtles, The Brave Little Turtle (McBarnet, 1994)
- Turtle cookies

Wednesday
- Read book: Just a Dream
- Paragraph on what they can do to help environment
- Watch "Save Planet Earth"

Thursday
- Review of pre-questionnaire
- Discussion of what was learned
- Sea Partners presentation
- Coloring book
- Reef doctor video
- Video of Sea Partners

Friday
- Post-questionnaire
- Review of post questionnaire
- Key to learning presentation

Having an outline (the one used in demonstrating the sections) helped me link all of the desired points and concepts together. Most of the sections fit into one or two days. Some of these sections can be expanded to cover more than just the main points from each.

Some of the concepts such as Animal Adaptations took a little longer for the students to understand, but over all almost everything

fit in. I found it very helpful from the beginning to have what I called "The Water Words." This was a list of all the new words we learned during the lesson. At the beginning of the classes I either reviewed the words or had a discussion about the words. Choosing only one concept from each lesson and focusing on it seemed to have the best results in furthering the students understanding..

"Tests" (that word scares most students), were only used to find out if the students were able to understand the concepts, I used other methods such as writing and art to really assess their comprehension. I found that the class discussions took the pressure off of the kids and it helped me understand what parts of the concepts they were having difficulty with.

Another assessment tool that I felt helped find out individuals understanding and also helped strengthen the students knowledge, was a journal that had been started from the beginning of the course. There is a copy of this Journal Labeled "Minds On" in Attachments A Variety of materials. .

Hands on experiments and demonstrations had to be well organized and discussed in such a way that the concepts and goals were very obvious. Some of the demonstrations such as the water movement lesson (Water Movement, Lesson Plans) were very clear to myself and those students seated close but due to the fact that some of these visuals were too vague to see from the back of the classroom the students in the back did not know what I was doing.

For this age group, if you are not under time constraints, it would be best to have the students do all of the experiments. For younger students the experiments need to be demonstrations. In the

"water movement" experiment I would just use more food coloring in the water. The version of the "Water Movement" found in the lesson plans has been changed so that the same difficulties don't happen with the demonstration.

Reading, showing videos, outside speakers, and field trips helped the students with bringing concepts into the curriculum in a different learning style. These also showed that there were others out there that felt or did the same things that we were doing and considered it important. It also introduced the importance of literature and art incorporated in the sciences.

With this unit I tried to relate the learning to past lessons in the class and also to life. The class had already learned about many of the concepts we discussed such as adaptations, "Rat Island" (Lesson Plans) which was introduced to the class before my unit; the food web, done with a game of finding the producer, consumers and decomposers (it is a different game then the one I use and they discussed land webs). The lesson plans for the Stepping Stones class along with the letter to the parents can be found in the appendix.

When creating the questionnaires I found that many times things that seem perfectly clear to myself might come across differently to others. Designing a test that meets many different learning styles is difficult. My first questionnaire was a flop and needs redesigning. I did learn from it that although students live right near the ocean and are fascinated by it, they know very little about the ocean and the importance of protecting it. The students were very frustrated with the questionnaire, which I didn't mean to

do. The second one was a lot better but there were some questions that when you leave them open-ended, for this age group, they either skipped or had difficulty understanding.

You can design tests that students can take and don't feel like they are "failing the test", even if they don't know the answers.. In the future the first test needs to be more multiple choice, fill in the blank, and true and false. For this age group essay questions are better as journal entries or class discussions but are perfectly adequate for fifth and sixth grades.

Anything too technical can be hard to grasp so experiments such as the "insulation experiment" can be altered for less math excluding the thermometers and numbers to just feeling for the younger students, K-2, or expanded to include measurements for fifth and sixth. In this class I only wanted them to get an idea of what science experimenting was like. I did not expect the data to be very accurate (the students did come up with some pretty interesting results which allowed us to examine the importance of being careful scientists).

I learned flexibility and no matter what there is a lesson in everything even an experiment that doesn't work can provide an excellent discussion. I found that the students expected me to know all the answers. Sometimes I just had to tell them that "to the best of my knowledge the answer is 'A,' but I will check on it and get back to you." It helped to review the material and try to know what concepts might cause confusion. I also had to know what types of questions the students might ask about certain topics.

We stressed in this class that even if they do not remember the vocabulary it was the concepts of educating themselves and others and not being afraid to take action.

Concluding Thoughts and Review

The possible holes I see come when this program is used as a class in itself. Since it supplemented an existing class, it may have a few concepts that I used as a foundation for my unit which I may not have mentioned in the overview section or the review section that were learned in the other class sessions. This also requires the instructor to provide a lot of tie in discussions to bring the entire unit together. It is a very fast paced unit and is only meant to briefly introduce the students to the topics in two weeks.

If the desired outcome is a more in depth look at the oceans it will take more than two weeks. Some of the details that were only briefly mentioned or skipped altogether were things like the microbial food web, nutrient cycles, etc.

Some of the weaknesses in my own performance came from the lack of experience. I'm sure the program could flow a lot better the second or third time. For next time I will try to be a little more relaxed, learn another phrase than" you guys, like, and I was all...". I will find some more resources, such as a beginning oceanography and chemistry book. I did not realize the places that I was missing information, or that my goals were vague.

The next time I start up a program I'm sure it will be easier since I have had this wonderful experience and gained so much insight to education, teaching, and students.

V Goals for the Future

A long time ago when I started down this pathway with all of my projects I had no goals in mind because I didn't think there were any programs to really get involved in. I fell into the jobs and positions that led to my getting this idea and now I see a lot more potential for its use rather than just a hobby or something that is done on the side.

Last year when I left here I had a plan for the future (Appendix) and honestly I had not even picked it up until I was about half way through this project. The interesting thing about it, although I had been very busy last year and not even intentionally done anything, was I had managed to move my way through the plan. The route I took was a little different than the route I had envisioned due to some obstacles in the road, one being my contact in the Coast Guard never called me back and I didn't have any spare time to go into schools and get contacts.

I did become involved in an organization working with youths and science (MBY) and by being involved in my "normal" arenas I was learning the programs in the area and their goals. I did not think I would get around to designing a program until years from now in my Capstone (senior thesis and CSUMB).

I have recently learned that a lot of the programs I had previously thought of as purely functional may be starting youth programs that go into schools as guest lectures. What do I want to do with this? I want to join them but I also want to modify this unit that I have designed for Hawaii. I would like to get this unit into the

schools because, although the programs have the guest lectures, the teachers can use the unit to help develop a total marine science unit.

The teachers in the schools may not know, have the time, or may not know how to incorporate it in to there programs. The most probable reason might be that they are not teaching the sciences that require these demonstrations and the energy it would take to make these demonstrations are better spent doing something else. The theory I have is that if I do the leg work and hand them a program that they can use and don't have to do too much work to adapt, they will be more willing to use it. I got this I idea partly through watching Friends of Heeia be extremely flexible with there lessons.

I have a lot of information already about Monterey and I think the best next step would be to modify and test the program in Monterey. The class I am taking next semester is supposed to do that, but if they don't I am working on other avenues where I might be able to test a programs such as in the MBA discovery lab (this is a place were youths are taught and encouraged to explore the ocean ecosystems), or MBY where we are currently in the process of designing a curricula for experiential, hands on youth programs, free to the community schools.

Its funny when I originally started doing this unit I only saw it as a hobby, a means to an end. It has turned out to be a much different pathway than I ever thought I would go down but it is what I have always wanted to do. There is a lot of potential pathways for this project but unlike last time this time it will be a lot harder to put down.

Some of the steps I need to take would be to find out what it would take for me to get my teaching credentials I think that programs like these need that aspect as part of them. What programs and teachers are willing to let me experiment or are willing to experiment with my ideas and or advise me. As I have looked through my "Plan for the future", the one I designed last year, my goals are still the same and I think I will continue or actually start following it a little more seriously.

APPENDIXES

APPENDIX A

Time Table With Progress Reports:

June 29: Introduction of myself and what I want to do to Mrs. Thayer's Class. Also taught an activity on recycling through the use of paper making.
July 1: Class trip to Heeia State Park
July 2: Proposal due
July 6: Registration for class due.
July 7-23: Help assist teaching on Tuesdays and Thursdays at Heeia State Park.
July 8: Begin going through Activities and sorting into categories.
July 10: Turn in an outline of proposed structure of class curriculum with a list of Themes, possible activities, and proposed evaluation.
July 10: Taught Light Lesson to Mrs. Thayer's class.
July 13: give pre-assessment to Mrs. Thayer's class.
July 13-24: Teach the curriculum in Mrs. Thayer's class.
July 27: Turn in the curriculum I used and an evaluation of its effectiveness.
July 27-31: Help assist teaching at Heeia State Park.
July 29: Begin focusing on post program analysis.
August 3: Complete a rough draft of program and evaluations and get input.
August 3: Help assist teaching at Heeia State Park
August 5: Help assist teaching Heeia State Park.
August 10: Help assist teaching Marine Biology lesson at Heeia State Park.
August 15: Submit final project

STEPPING STONES
SCIENCE LESSON PLANS

These Plans were put together by Jackilyn Thayer for a summer science and math enrichment course taught at Iolani Elementary School in Hawaii. The Program was taught within this class and was designed to fit into her lesson plans.

WEEK 1:

Monday June 15
1) Name Game-(NERF) Name-Enjoy-Reason here-Fear
2) Initiatives (Circle, mass stand up, data processing)
3) Divide into 2 groups- red volcanoes and Blue dolphins
4) Team interview-each member interviewed by group
5) Classroom rules. Gordons knot
6) Read: A Friend Is Someone Who Likes You
7) Introduce daily journals-pass out covers and color front/ back
8) Introduce vocabulary chart-new words for the day
9) Pass out weeks questions/letter to parents about class

Tuesday June 16
1) Read: Character Grows.
2) Review classroom rules
3) Introduce Learnball: pick officers for each group/ explain
4) points and chart for record keeping/show down/freeze
5) Initiative- Knot Me
6) Introduce paper- A Poem About Me/draw self picture
7) Each group make Volcanoes or dolphins mobile
8) Finish up journal covers
9) Introduceorienteering/compass/maps/stars/sun/memory
10) Take trust walk
11) Read: Secret Life of Dilly McBean

Wednesday June 17
1) Review ways of orienteering- intro. compass-find NEWS/ magnetic North
2) Pass out compasses-discuss markings-practice bearings
3) Stand on circle turn to set bearings- 2 teams locate bearings in relay race
4) Review Learnball/intro. each team throwing ball at a target for points
5) Finish up Poem About Me
6) Write in journals
7) Continue reading Secret Life of Dilly McBean
8) Learnball- throw ball each team add up points for the day

Thursday June 18
1) Review orienteering/list on chart ways we find our way
2) Practice compass bearings/ Nature Walk/ 4 groups/outside give bearing groups walk in directions write down everything in path
3) Initiative/GetitTogether
4) Xerox paper "This is my name" - write name in different
5) Journal entry-pg. 4 What's the Most Important things to have if you are lost
6) Make a map of your room
7) Learnball- 3 from each team throw ball/add up points

Friday June 19

1) Read from Relationship of Living Things pg 6-9-comparing different places- if you could go any place where would it be?
2) Intro. Teacher anthology pg 2
3) Journal entry pg. 1- Living things that share your neighborhood-each student shares with group
4) Intro. California relief map-show where I live- Mammoth Lakes
5) Show video- Within the Range of Light -music no words of places in my area
6) Pass out Human Treasure Chest- have students fill out form
7) Learnball/throw ball/add up points for daily winner

WEEK 2:

Monday June 22

1) Read: Relationships of Living Things pg 10-13
2) Read: Very Last First Time
3) Journal entry: pg.2 You get information from books in 2 ways-words and pictures- in Very Last First Time write what you got from the words and from the pictures
4) Initiative: Name-o-gram- 3x5 cards-each student writes name backwards-read one by one students guess who
5) Videos-"Volcanoes" and "The Sleeping Giant"-son made in 7th talking about Long Valley Caldera Discussion-3 different kinds shield(basaltic)-Hawaii2)cinder(andesitic)-MammothLakes3) composite-Mt. Fuji-movingcontinents/platetectonics
6) Put students in pairs-share Human Treasure Chest(questions about self)- pairs introduce each other in front of class
7) Pass out week 2 homework questions
8) Learnball-3 students from each group throw ball at target

Tuesday June 23

1) Review volcanoes-discuss what they are made of and the layers of the earth (crust, mantle, inner and outer core) how are rocks formed
2) Make a volcano experiment (baking soda/vinegar)
3) Read: Relationships of Living Things pg. 12-14-define ecosystem/biodiversity
4) Video: The Magic School Bus "Blows Its Top"
5) Read: The Big Rock
6) Continue students intro. of each other-Human Treasure Chest
7) Journal entry pg. 3- listing ecosystems in our neighborhood
8) Learnball 3 students from each group throw ball

Wednesday June 24

1) Read: The Magic School Bus-Inside the Earth-Discuss layers of the earth-look at the mural showing inside the earth and the layers of a volcano
2) Pass out questions for research report- Discuss each (What is a Volcano, What's inside the Earth, How are rocks formed, What is soil etc.) Allow time for research in the room and at library
3) Journal entry pg. 3 and 5- Why do we need volcanoes? Which volcano would you like to live by? Why?
4) Read: Everybody Needs a Rock
5) Learnball-3 students from each group throw for points-add up for winner of the day
6) Set-up growing crystals (Geology pg. 17-18)

Thursday June 25

1) Review kind of volcanoes
2) Experiment on what causes a volcano to explode shaking a soda bottle
3) Field Trip- Lucoral Museum-display and discussion of different gems minerals rocks
4) Video-on gems from the museum
5) Learnball

Friday June 26

1) Finish up video on gems
2) Make and bake a volcano-(How Earth Works pg.56) cut out circles of pastry (biscuits in a can) place jam in center of circle, place in muffin tin, pinch up sides to form a volcano
3) Continue research on questions
4) Go over all questions- review how to research-write down ideas on board
5) Initiative-Lapsit
6) Volcano crossword
7) Journal entry
8) Finish up anything not completed- Human treasure, research on questions
9) Learnball

WEEK 3

Monday June 29

1) Discuss how man/scientists find out about changes on earth-learn about the past? (study earth's layers, fossils
2) Read: Living Things: Change Over Time pg. 10-13 Make fossils in plaster pg. 13-students In case leaves, shells, bones, etc. in plaster
3) Read Dinosaurs- pg. 14-21
4) Distribute packets from Language Arts-pg 209-221 on Dinosaurs
5) Research Papers-As students bring in reports have them present in front of group
6) Pass out inf. on party for 4th of July- students bring something red, white blue to eat
7) Learnball

Tuesday June 30

1) Read: The Magic School Bus-Dinosaurs
2) Video- What Ever Happened to the Dinosaur? (567.9WHA)
3) Break up plaster with fossils- Discuss what does a paleontologist does to get every piece out a rock- Living Things Change Over Time-pg. 14-21
4) Packet- Dino-Sort- pass out bags of candy dinosaurs students use them to answer questions in packet
5) Journal-Describe a make believe dinosaur- what does he look like, eat, live?
6) Book Fair - 9:50 in library
7) Continue research paper presentations
8) Remind students of red/white/blue treats for party
9) Learnball

Wednesday July 1

1) Field Trip- Heeia State Park- ecosystems, coral reefs, animal adaptation, water pollution, marine and cultural environment etc.

Thursday July 2

1) Read: Teacher Anthology-One Day in the Woods
2) Read: Relationships of Living Things p. 12-17- discuss large and small ecosystems

3) Continue research paper presentation
4) Look at bulletin board displaying where I live- Death Valley, Mt Whitney, Bristle cone pine, Mammoth Lakes, Mono Lake, Yosemite Park
5) What is a National Park? Why do we need to protect them?
6) Video- Death Valley
7) Activity Book- Discover Death Valley read pg. 4
8) Journal pg 6 and 11- What would happen if all the plants died? What would happen if the sun stopped shining? If you were lost in Death Valley what things would you need in order to live?
9) Continue research paper presentations
10) Party Food pass out all during the day
11) 4th of July Parade 9:50
12) Learnball

Friday July 3 Holiday

Week 4

Monday July 6
1) Read: Relationships of Living Things- pg. 18-23 A Swamp ecosystem, community, population, habitat, endangered, extinct
2) Journal pg 7 list 5 things you need in order to survive-live and grow, pg. 8 What do you think causes animals to become endangered-extinct?
3) Mammoth Lakes-my home-living on a volcano-look at pictures-show objects of the area-pine cones, pumice, pine needles, sand
4) Yosemite Park-National Park-over the mountain from Mammoth
5) Video-"The Fate of Heaven" - Yosemite Park
6) Yosemite Activity Book-Discover Yosemite- pg.4,10,12,15,17,18,22,29,33
7) Introduce John Muir-conservationist-read Journey to the Heart of Nature pg. 11-17, Saving the Wilderness, pg. 5-9
8) Project Wild- pg 29 and 39- What's a habitat? review animal habitat- what do animals need in order to survive?-air, food, water, shelter, space
9) Journal pg. 12- If you were John Muir what would you say about Hawaii?
10) Home work- One and Only-3x5 card-each student write description of self-will collect and read-students guess who it is
11) Learnball

Tuesday July 7
1) Read: Urban Roost- Relationships of Living Things pg. 23- Take a walk around school-see what things in your school community-write down
2) Journal pg. 9- Compare community in Urban Roost with your school community
3) Introduce- Mono Lake ecosystem- show video "Fire and Ice"
4) Activity pages from manual on Mono Lake -look at calendar-show tufa from the lake- brine shrimp-brine fly- 90% of California Seagull come to lay eggs
5) Relationships of Living Things assessment tests 1 and 2 give to students
6) Learnball

Wednesday 1) Read: Relationships of Living Things- pg. 28-32-energy in

July 8

ecosystem-producers, consumers, decomposers-scavengers-omnivores, carnivores herbivores prey predators

2) Journal pgs. 13 and 14-draw a picture of the above animals-use activity books on Plants and Animals of the Eastern Sierras and Exotic and Native Animals of Hawaii to get ideas
3) Outdoor Learning-pg 65 and 67- Plant and Animal Life pg 85 and 94 Plant study-living things grow from seed to maturity; die-drink water, nutrients sun-manufacture food-things that effect plants: insects, disease, wind, fire animals, man. Animals-born, mature, die-dependent-upon air, food water, sunlight, shelter, to live -survive
4) Xerox- Animal habitat/ Nature words jumble
5) Learnball

Thursday July 9

1) Review all terms learned Wednesday
2) Read: Relationships of Living Things-pg. 30-32- Food Web-what is it?
3) Rat Island-review what adaptation is-what causes animals to adapt/survive-divide group into 4- pass out the 4 different islands and descriptions of each-have students develop a rat that can adapt to their island-write down the adaptations and draw the island and rat- will be presented in front of class
4) Divide into 4 groups and work on Rat Island
5) Learnball
6) Bring in junk mail for making recycled paper

Friday July 10

1) Introduce Food Web/Food Chain- Read: Relationships of Living Things pg. 34-35- Project Wild-pg. 233- definition of food web-Animals depend on plants ,sun, shelter, water, soil, air, food and space to live in-why?
2) Activity packet-"Food Chain"-Nature's Forest Food Web-look over and discuss
3) Journal pg. 15- practice drawing a food web
4) Food Web Game-2 sets of cards with forest animals and man and plants-put one set on board in circle-pin one card on each student-have each student come up and draw a line from their animal to ones they eat or eat them
5) Rat Island- break up into groups and continue working on project
6) Learnball
7) Remind students to bring in junk mail for recycled paper

WEEK 5

Monday July 13

1) Rain forest- what is it? Why important?
2) Video: "Fern Gully"- destroying a rain forest (while they watch paint their graph Hawaiian or pilgrim quilt square
3) Scavenger Hunt-give students a list and a bag-explain the rules and show meeting place- the sun trap is anything that captures the sun's heat e.g., rocks, water, plants, animals
4) Read: Relationships of Living Things pg. 36-40- organisms act on each other in order to survive in a habitat
5) Introduce art activity: Sun Catchers-show students samples of sun catchers and how the light effects them pass out graph paper to make designs-colored beads and string
6) Paper making in art room in two groups while others make sun catchers
7) Activity Book- Save the Rain forest
8) Journal entry 17- Why is a rain forest important?

7) Learnball

Tuesday July 14

1) Review Rain forest importance
2) Read: Relationships of Living Things-pg. 40-47competition-how everything survives and fits together
3) Read: The Great Kapok Tree-discuss
4) Video-Nationalgeographic "ReallyWildAnimals-TotallyTropicalRain Forest"
5) Work on Rain Forest activity book/sun catchers/quilts
6) Journal entry pg 17-18 predator or prey in rain forest
7) Learnball

Wednesday July 15

1) Video: Help Save Planet Earth- write things on board that areendangered
2) Read: Relationships of Living Things- pg. 48-59-learning the importance of water to every living thing- what is the water cycle-why is itimportant?
3) Journal entry-pg 23 When rain sinks into the ground
4) what happens to it? draw a picture
5) Quilt square-draw picture of what they think the ocean should look like then trace on material and paint for quilt "I Can...." saving the oceans
6) Work on quilts sun catchers or any other unfinished
7) projects
8) Learnball

Thursday July 16

1) Finish video : Help Save Planet Earth
2) Read: The Lorax-cassette/book/video
3) Make chart of things we can do to save the environment
4) Journal entry- pg.20- list things that are in threat or danger
5) Environmental Science packet do as a group-discuss each page
6) Work on quilts, sun catchers, or any other unfinished projects
7) Learnball

Friday July 17

1) Introduce- Woodsy Owl- Forest Service symbol for environmentalawareness-readcover-reviewinterdependenceaffects survival andquality of life
2) Read: Woodsy's Ways- a story about Woodsy Owl- list Woodsy's environmentalproblems-litterhurtseveryone-noisepollution-air pollution-water- vandalism-solutionspg. 18-23-clean-up,recycle,etc.
3) Relationships of Living Things-pg. 56-63-all living things need each other-Teacher Anthology-pg. 12
4) Journal entry pg. 22-What can we do to save Planet Earth and its environment?
5) Learnball

WEEK 6

Monday July 20

1) Read: Don't Pollute-cassette/ review things Bernstein bears learned
2) What on Earth are we doing? What is Ecology? What is biosphere?
3) Think Earth- Xerox pg. 5-11- do as whole group read calendar-Tips for Planet Earth-rain forest, desert oceans, coral reefs, wet lands, rivers, lakesetc.
4) Form 4 groups they make a list of things in threat or danger and discuss what they can do about it

5) Read: Protecting Our Environment
6) Work on finishing up any projects
7) Learnball

Tuesday July 21

1) Rescue Mission: Planet Earth-read-major threats to the Earth's environment-extinction, global warming, over-population, waste. Natural world- rain forest, mountains, lakes, rivers, oceans, coral reefs, seashores, wetlands, ozone, grassland. Human world-population, health, poverty, consumption, waste, lad use, city, wild life
2) Groups read lists of things in threat-discuss solutions
3) Video- "Think Earth"
4) In small groups make sea turtle cookies for open house-as they work on completing other projects
5) Journal entry- pg. 20- What can we do to save our Planet Earth and its Environment?
6) Homework- write paper on what you can do to save the oceans and this will be put up open house
7) Finish all painting material squares
8) Learnball

Wednesday July 22

1) Classroom EarthSummit-program-discuss what it is divide into 4 groups-assign each group one topic(air, land, water, people)-distribute fact sheet to each group-each group discuss facts in topic area-each group ranks 3 top concerns and suggest solutions-group will submit finding to class
2) Sea Partner visit- David Kokata- U.S. Coast Guard
3) Journal entry pg. What was your favorite activity in Stepping Stones? Why?
4) Make sure everyone has finished up all projects
5) Learnball

Thursday July 23

1) Read: Just a Dream- discuss important findings
2) Earth Summit- Each group present their findings- have students sign a pledge to help the environment
3) Take down all student work from walls and everything placed in individual bags-send home
4) Have students write what they liked about Stepping Stones and give ideas for next year
5) Last Learnball

Friday July 24

1) Read: Brother Eagle, Sister Sky- Indian concept of earth and what our places is
2) Discuss Stepping Stones and student input for next year
3) Pass out fish key chains teacher made
4) Work on Sea Partner coloring book
5) Learnball- Shot card shoot out- everyone gets to use up earned shot cards
6) Super Sundae party!!!!!!!!

APPENDIX C

FUTURE PLAN SUMMER '97

As I was looking back over everything I learned, I saw a lot of things that I think could make a program strong. Somehow I would like to create a program that others could do that would allow people to learn quick, easy and effective ways of helping teach conservation.

I need to get a hold of the USCG in my area and find out where they would be willing to help me and where I could help them. I need to find any other programs in the area that could use my help or would give me some information. The aquarium would be a great resource in helping develop an ocean awareness program. I sat down and looked at where I could go and possible paths I could take this project.

My Road Map

Phase I

Explore Outside areas
find different educational programs
programs that are experiential hands on
In Hawaii make contacts

Phase II

establish contacts in Monterey
Explore Monterey's resources
get involved in programs outside
get involved in programs that go into schools
Mentor/ Intern

Phase III

Create a design for program
get backing (school and outside)
try test run program (smaller version)
work out bugs

create larger program

Phase IV

Take the program outside
create a package others can use
establish a training program for leaders

These are some of the issues I came up with when I looked into establishing a program.

Potential Organizational Collaborators

1. US Coast Guard
2. Monterey Bay Aquarium
3. CSUMB (service learning and teachers)
4. Friends of the Sea Otters
5. Presidio of Monterey
6. Dive Shops
7. MBARI (Monterey Bay Aquarium Research Institute)
8. MLML (Moss Landing Marine Labs)

Issues to be addressed

1. Pollution
2. Conservation
3. Education and Awareness
4. Possible threats to the ecosystem
5. Man's involvement in the environment
6. Solutions

Audience

1. School-aged Children
2. Community College Students
3. University Students
4. General Public

5. Community

6. Tourists

7. Government

Career Possibilities

- Teach Conservation and /or Marine Science
- Veterinarian for Stranded Marine Mammals
- Develop a program for marine awareness

If I decided to continue with this path beyond college I would need teaching credentials, speech classes, understanding of teledramatic presentations, biology, zoology and other beneficial subjects. I think languages and culture will help so I can present to more than one social structure. This thing would and could also travel. Only problem is I would have to create or find a company that could allow me the freedom to develop and promote a program. (Maybe the United Nations or the U.S. Coast Guard)

I am a dreamer but if I want to I can do this well. This is something I could get people involved in; I just need to learn how to present and how to delegate. I am a leader and I should use that. I can't be too hasty and must be willing to step down or to take a back seat, and most of all I have to work with and accept others' ideas.

I thought about how ludicrous it is for me to try to tackle this whole job in one shot. There is the information, the laws, and the logistics of the program. I know I can't focus on all of it, but I want people to know I looked into it. There is a lot more to this than meets the eye, and it will probably take me longer than I had

planned. I researched the Hawaiian part sufficiently, but I could stand some more hands on practice. Patience's is required to play my cards right and make this come out effectively.